

Abstract of the Disclosure

Spectroscopic system and spectrometers including an optical bandpass filter unit consisting of a plurality of bandpass regions and a spatial encoding unit for encoding discrete frequencies of light passing through the optical filter. The incorporation of the encoding unit allows the spectrometer system to use a detector consisting of one or a small number of elements, rather than using a more expensive detector array as is commonly used with filter-based spectrometers. The system can also include an integrating chamber that collects the light that is not transmitted through the bandpass filter unit and is substantially reflected, and redirects this light to strike the filter unit again, resulting in a significant increase in the optical power passing through the filter. The integrating chamber maximizes the return of the reflected light to the filter assembly and minimizes optical losses. The integrating chamber may be an orthogonal design to preserve the optical geometric characteristics of the light entering the chamber, even after multiple reflections from the optical filter.

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